# Highway Construction: Quarterly Update

## Construction Industry Costs Advertisement Prices

The construction industry across the country has been buzzing with discussion of price run-ups for construction inputs including materials, fuel, equipment, and labor. Adverse trends had been apparent throughout the last year, especially for steel (heavy overseas demand, although a price surge seemed to begin to level off somewhat during mid-2005), cement (supply shortages) and energy (upward trends for fuel for construction equipment and energy inputs into materials).

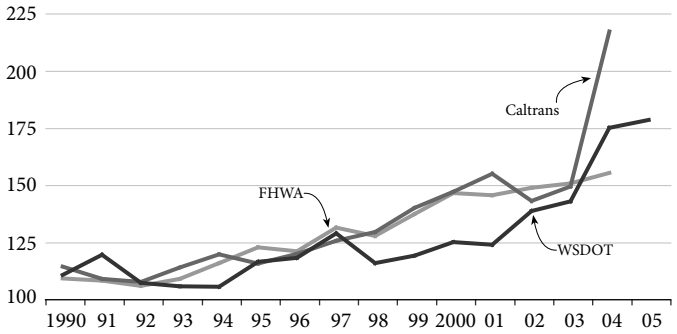
In the aftermath of Hurricane Katrina (and then, to a lesser extent, Wilma), concerns heightened especially at the prospects of still higher energy prices as well as new demand-side pressure on industry resources from Gulf area re-building. The Gulf States situation also raises concerns for shortages of skilled labor and experienced construction engineers and project managers, as well as overall construction industry capacity. Conversations with construction industry experts also touch on potential difficulties for contractors' access to surety bonding. Discussions also address the adverse implications for the true competitiveness of pricing in the industry from the on-going trends toward industry concentration, i.e., fewer and fewer big contractors taking more and more of the overall industry pie.

In recent weeks, news has been spreading among state and local transportation departments of "sticker shock" as bid openings have shown contractors' pricings appreciably above project estimates.

Some of WSDOT's recent bid openings have not been reassuring. For example, WSDOT recently opened bids on *SR 3 – SR 303 Interchange*, and despite the agency's efforts to incorporate the impact of cost escalation into the estimate, WSDOT still missed the low bid by almost 17%. The second and third low bids were in the same general range. WSDOT's estimate was $14.33 million, while the low bid was $16.74 million. WSDOT is currently analyzing the bid tabs to understand the differences, but the initial impression is that the cost of fuel in equipment and trucking, as well as the steel cost in the bridge superstructure and sign structures, are the major areas contributing to this difference.

On a positive note, WSDOT opened bids on *I-5 48th to Pacific* in late June and was pleased to find the low bid to be under the engineer's estimate by 4.7%. This project was awarded to

**Annual Construction Cost Index**
**WSDOT Base 1990 = 110**
**FHWA and Caltrans Base 1987 = 100**




**Quarterly Construction Cost Index**
**WSDOT Base 1990 = 110**
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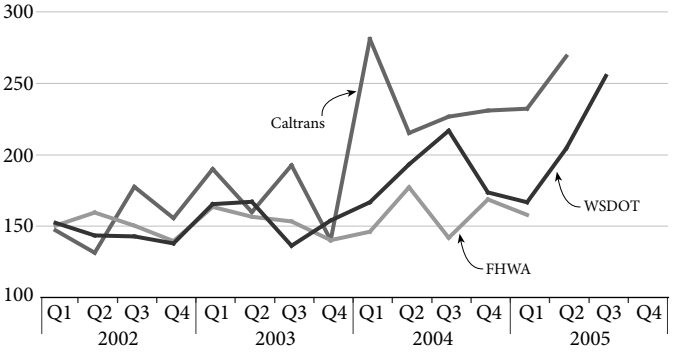



"Sticker shock" is exactly what the Arizona DOT experienced when it recently opened bids for a project providing improvements at the junction of Red Mountain, Satan Highway, and U.S. 60. The engineer's estimate for this project was $58 million; the low bid came in at $71 million, and the second lowest bid at $84 million.

# Highway Construction: Quarterly Update

the low bidder Kiewit Pacific for a contract amount of $72.87 million. The second bidder on this project submitted a price of $78.42 million, which was 2.6% over the engineer's estimate.

WSDOT's experience of a volatile bidding environment is similar to what is happening in other states (see gray box on page 43). One significant difference between Washington and other states is that WSDOT is still seeing strong competition by bidders for its projects. Other states such as Florida, California, and Arizona are reporting a decrease in the number of bidders on large projects. Some states are even experiencing an increase in the occurrence of single-bidder bid openings.

**Trailing Indicators**

WSDOT prepares its construction cost estimates from the information about market conditions drawn from recent bids, not from a crystal ball of future market conditions. WSDOT accumulates construction cost information into a construction cost index and compares that information against the experience of other states. WSDOT's Construction Cost Index is a composite of unit price information from low bids on seven of the most commonly used construction materials. These items reflect a composite cost for a completed item of work and include the cost of labor, equipment and materials.

The first of the graphs on page 43 shows WSDOT's experience since 1990, plotted against similar types of cost indices maintained by the Federal Highway Administration (FHWA) for the country as a whole and by the California Department of Transportation (CalTrans) for California. The second looks in greater detail at the most recent 15 quarters. FHWA has not yet released data on the two most recent quarters. WSDOT will be including Construction Cost Indices for other states in future editions.

**Making information available to the public**

This quarter, WSDOT began publishing its materials costs on its website. In line with the agency's "No Surprises" philosophy, details on costs trends are now available to the public with updates occurring at the end of every quarter. To view some of the most recent costs by quarter, see the graphs on page 46. These graphs, as well as costs on an annual basis from 1990 to 2004, are available at www.wsdot.wa.gov/biz/construction/constructioncosts.htm.

**Fuel Cost Escalation Pilot Project**

WSDOT is currently evaluating the use of an escalation clause on a pilot basis to try to buffer the impacts of fuel escalation to the contractors. This clause would shift the risk of price increases during the life of the contract from the contractor, who includes it in the bid, to the state, which would pay the increased or decreased cost of fuel during the life of the project. This clause does not eliminate the financial impact of escalation to the project, but rather shifts its risk from the contractor to the owner, to fund as it materialized throughout the project.

**The Crystal Ball**

In the world of markets, everyone knows by heart the disclaimer in the advertisements for mutual funds. "Past results are not a guarantee of future performance." This is precisely the case when looking ahead to national and local construction industry pricing, especially when price volatility seems inevitable from the many trends the industry now faces.

WSDOT's construction cost estimates are necessarily based completely on available trailing indicators and there is neither data nor methodology from which engineers can estimate projects based on crystal ball forecasts of changing future prices. In the Cost Estimate Validation Process (CEVP)™, which WSDOT is applying to large projects, some account is given to baseline future inflation.

For future project costs, WSDOT applies industry standard inflation rates to base estimates in order to project year of construction costs. Recent trends indicate that tables detailing inflation rates were in need of update. The rates used on these tables were evaluated against updated industry forecasts and updated. The changes to the tables include a higher than previously forecasted inflation rate for 2004 and 2005 and an updated forecast for future years. Updating the inflation rates used to forecast future costs attempts to reflect some of the recent price trends.

Recent coverage of construction industry inflation in *The Engineering News Record*, the leading industry periodical, contained the following statements, none of which can be regarded at this time as more than the weathervanes of industry sentiment:

# Highway Construction: Quarterly Update

*The major uncertainty relates to the price and availability of building materials, which means in the near-term that the construction industry will continue to adjust to a higher cost structure.*

*A recent pre-Katrina survey of 167 public owners found that 92% of the owners experienced an average increase in their project cost of 13.2% in 2004, says John Dunkerley, chief estimator for PinnacleOne, Phoenix, which commissioned the survey. "Katrina will only aggravate those conditions," he says. "I had expected industry escalation to slip back to 5% this year. But now I'm expecting Katrina to spike it up over the next 12 to 24 months by 10 to 20% a year."* (from *The Engineering News Record*, September 26, 2005)

**What can WSDOT do?**

In volatile markets, contractors must place their own contingencies against inflation into fixed price bids. If their contingencies are larger than turn out to be required, windfall profits result. The opposite is also true, and can lead contrctors to significant losses on jobs. WSDOT and many other states across the country are now examining whether these risk elements can be removed from contracts in a volatile pricing environment by making bids subject to unit price adjustments from time-of-bid base bid costs. WSDOT has also worked with industry to allow contractors to expedite purchase of materials in order to be able to lock in key materials requirements for the jobs they win.

## The Seven Common Construction Items That Make Up the WSDOT Construction Cost Index

The costs of these seven materials are calculated on a quarterly basis to determine WSDOT's construction cost index (CCI). Four of them are included in graphs on page 46 which show trends lines for increasing costs over the past 15 quarters.

***Crushed Surfacing:***
Crushed surfacing is used in construction of highways to establish a drainable base or platform underneath concrete pavement or Hot Mix Asphalt for the final roadway surface. Prices have held constant since 2004 based on the annual trendline.

***Hot Mix Asphalt:***
Hot Mix Asphalt is one of the common driving surfaces constructed for state roadways. Prices have increased 14.6% since the first quarter of this year based on the quarterly trendline.

***Concrete Pavement:***
Concrete pavement is another of the common driving surfaces constructed for state roadways. Prices have increased 13% since 2004 based on the annual trendline.

***Structural Concrete:***
Structural concrete is used to construct bridges and retaining walls. Prices have increased 27% since the first quarter of this year based on the quarterly trendline.

***Steel Reinforcing Bar:***
Steel reinforcing bars are used in bridges and retaining walls to reinforce the concrete. Prices have edged up roughly 1% since the first quarter of this year based on the quarterly trendline.

***Structural Steel:***
Structural steel is used to construct bridges and certain types of retaining walls. Prices have increased 9.7% since 2004 based on the annual trendline.

***Roadway excavation:***
Roadway excavation is the activity of moving the native material (soil) on a construction site from one area to another, or off site for disposal. Prices have increased 22% since the first quarter of this year based on the quarterly trendline.

# Highway Construction: Quarterly Update

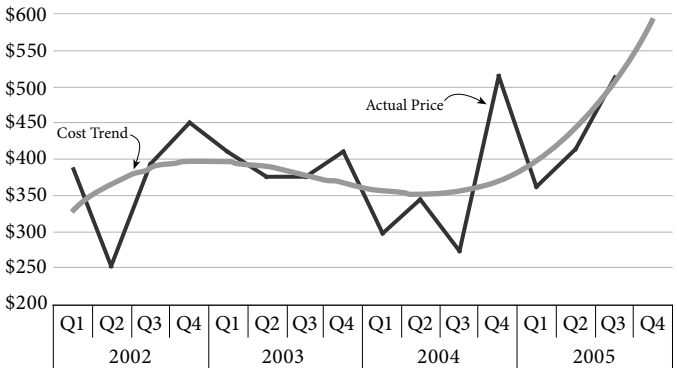
## Bid History Graphs

The graphs below reflect the unit bid price for four major construction materials, and exemplify the increasing cost trend. "Unit bid price" means the amount the contractor bid per unit of material (e.g., dollars per cubic yard of structural concrete). Unit bid prices include labor costs, which is standard for the highway construction industry. Exact details are difficult to derive from the graphs shown but they are very useful in describing trends. It is difficult to derive exact details because project quantities vary substantially from project to project based on the size and geographical setting of the project. Rural projects generally tend to have unit bid prices on the lower end. Projects with larger quantities generally have lower unit prices, as the contractor is able to distribute its fixed costs over a broader base of units. With this said, the individual data points represent the trailing indicators, and the extension of the trend line is the crystal ball projection.

### Structural Concrete

**Quarterly Unit Bid Price**

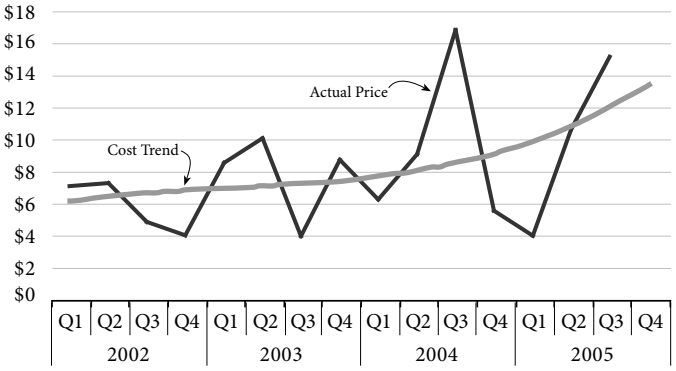
*Dollars per Cubic Yard*




### Roadway Excavation

**Quarterly Unit Bid Price**

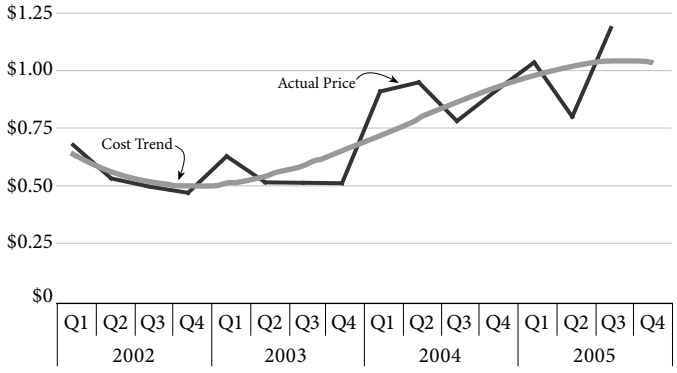
*Dollars per Cubic Yard*




### Steel Reinforcing Bar

**Quarterly Unit Bid Price**

*Dollars per Pound*




### Hot Mix Asphalt

**Quarterly Unit Bid Price**

*Dollars per Ton*